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"It's not time for us to sit down yet": how group exercise programs can motivate physical activity and overcome barriers in inactive older adults

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ABSTRACT

Purpose: Physical activity and exercise are critical for older adults' physical and mental health. The purpose of this qualitative study was to richly capture the motivators of and barriers to engaging in physical activity in previously inactive older adults who participated in a three-arm randomized controlled trial (RCT) of eight-week group exercise interventions.

Methods: We conducted a qualitative content analysis of individual interviews with fifteen participants—five from each study arm: strength training, walking, and inactive control. Participants included nine females and six males ranging from 60 to 86 years of age.

Results: Key motivators of physical activity included perceived improvements in physical and mental health, positive social influences, observed health deterioration in others, and the desire to spend time with and take care of family members. Barriers to physical activity included existing health conditions, fear of getting hurt, negative social influences, perceived lack of time and motivation, inconvenient times and locations, and monetary cost.

Conclusions: Our findings add to the body of literature identifying factors that motivate and stand in the way of older adults' engagement in physical activity. These factors influence older adults' self-efficacy and should be incorporated into the design of new and existing programs to encourage initiation and maintenance of physical activity.

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Introduction

Older adults often struggle to get the recommended amount of exercise or physical activity (CDC, 2019; Watson et al., 2016). They are the fastest growing but most physically inactive age segment of the U.S. population. Up to a quarter of adults aged 50 years or older are physically inactive in the U.S. (CDC, 2019), and the prevalence of inactivity significantly increases with age (Watson et al., 2016). Physical inactivity negatively impacts older adults' health and quality of life and increases the risk of cardiovascular mortality, breast and prostate cancers, recurrent falls, fractures, functional limitations, cognitive decline, dementia, and depression (Cunningham et al., 2020). Community dwelling adults 50 years or older spend $860 billion annually on health care, and four in five of the most costly chronic conditions among this population can be prevented or managed with physical activity (CDC, 2019). Compounding the need for more physical activity is the unprecedented growth in the number and proportion of older adults who will account for roughly 20% (about 72 million) of the U.S. population by 2030 (Watson et al., 2016). Therefore, it is critical that we understand how to motivate and overcome barriers so older adults may become and continue to be physically active.

Group exercise programs can combat the physiological and psychological vulnerabilities associated with advanced ageing. For example, exercise programs for older adults have been shown to increase muscle mass and physical function (Fragala et al., 2019; Guizelini et al., 2018; Hsu et al., 2021; Nicklas et al., 2020; Ozaki et al., 2019) and improve chronic conditions such as diabetes, heart disease, arthritis, and obesity (Beavers et al., 2018; I-M. Lee & Buchner, 2008). Exercise programs can improve participant's bone density and reduce the risk of osteoporosis and related fractures (Foster & Armstrong, 2018; Giangregorio et al., 2014) and improve psychological well-being (Netz et al., 2005; Singh et al., 2005), self-confidence (Dionigi, 2007), and sleep quality (Baker et al., 2020; Yang et al., 2012). Group exercise, in particular, has been shown to balance health in older adults both in the physical, mental, and social aspects (Komatsu et al., 2017), as a simple and sustainable method to impact physical activity behaviours and increase motivation in older adults (Beauchamp et al., 2018). Exercise programs promote active lives by enhancing a sense of self-efficacy (i.e.,

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one's degree of confidence in performing the behaviour in the face of various obstacles and challenges) through increased self-esteem and comradery with peers (Allison & Keller, 2004; Elavsky & McAuley, 2007; Lynch et al., 2022; McAuley & Rudolph, 1995; Netz et al., 2005; Perkins et al., 2008). Exercise can promote a reciprocal effect in which self-efficacy increases physical activity, creating a positive feedback loop, and one's physiological state can influence self-efficacy. For example, individuals interpret fatigue, shortness of breath, or pain as indicants of physical inefficacy (Bandura, 1997). However, experiences of success increase one's self-efficacy and, once established, can generalize to other activities thereby influencing overall quality of life. While there is evidence that group physical activity for older adults is effective, evidence related to factors that motivate and dissuade inactive older adults after they initiate engagement in group physical activity is sparser.

The socioecological model is a conceptual framework that recognizes individuals as embedded in levels that influence their behaviour (Glanz et al., 2015; McLeroy et al., 1988a; Sallis et al., 2006). Levels of influence include 1) intrapersonal (e.g., knowledge and attitudes of the individual), 2) interpersonal (e.g., family, friends, instructors), 3) organizational (e.g., exercise programs), 4) community (e.g., physical environment and cultural norms), and 5) public policy (e.g., local, state, and federal policies) factors. All levels of influence are important and health interventions such as group exercise programs targeting multiple levels are more effective (Glanz et al., 2015). Therefore, the framework is often used to study physical activity for older adults. It has been used to study facilitators and barriers to participation in community sport programs (Jenkin et al., 2018), nationally disseminated programs promoted by Medicare (Bethancourt et al., 2014), and programs that use public venues such as malls and zoos (Belza et al., 2017). The model has also been used to study physical activity in specific groups of older adults (Baert et al., 2015, 2016; Johs et al., 2019), including those who are active or inactive (Boulton et al., 2018).

The purpose of this qualitative study was to identify the motivators of and barriers to engaging in group physical activity in previously inactive older adults (i.e., those aged ≥60 who did not get the recommended amount of exercise or physical activity) after taking part in a three-arm randomized control trial (RCT) of group exercise programs. Through their subjective lived experience and perspectives, we aimed to answer the following questions: How would previously inactive older adults who took part in the RCT describe their motivations for participating in group physical activity and what stands in their way of being more physically active on a regular basis? Findings were aligned with domains from the socioecological model (Glanz et al., 2015; McLeroy et al., 1988b) and add to the body of literature identifying motivators of and barriers to older adults' engagement in group physical activity. Findings can be used to inform the design and delivery of future and existing exercise programs and can be used to promote programs for older adults to encourage initiation and maintenance of physical activity.

Methods

RCT background

This qualitative study enrolled older adults taking part in a three-arm RCT of eight-week group exercise programs—Stay Strong, Stay Healthy (SSSH) resistance training program, an exercise duration-matched walking (Walk) program, and an inactive control (Con) group. Founded in 2005, the SSSH program expanded the StrongWomen RT curriculum (Seguin et al., 2008) to include both men and women and shortened the program to ten weeks. To provide the most beneficial results to older adults in the least amount of time, SSSH recently evolved into a progressive eight-week program with the ultimate goal of providing the greatest physical benefit in the shortest amount of time. Details of the current SSSH program's exercise structure, tempos, and progression pattern have been described elsewhere (Baker et al., 2020; Baker, Miller, et al., 2021; Baker, Syed Abdul, et al., 2021; Ball et al., 2013; Syed Abdul et al., 2016). Both the SSSH and Walk groups met two times per week for sixty minutes and classes were led by trained instructors. Participants in the Con group were asked to refrain from any strength training or structured forms of exercise for the duration of the study. The intervention period for trial participants lasted eight weeks. Interviews for the qualitative study took place during weeks nine and ten (i.e., one to two weeks post intervention). Before enrolment into the RCT, participants completed an initial screening questionnaire to confirm eligibility. Inclusion criteria for the RCT were being ≥60 years of age, inactive (no strength training and less than thirty minutes per week of other structured exercise), independently ambulatory (canes and walkers permitted), and free from physical injury or illness preventing physical activity. Exclusion criteria were answering yes to two or more question on the Physical Activity Readiness Questionnaire (Thomas et al., 1992), female subjects who had not fully gone through menopause (self-reported), previous participation in the SSSH program, and having dementia/Alzheimer's or other cognitive impairments that would limit one's ability to safely follow directions. The results of the RCT are reported elsewhere (Baker et al., 2020). See Figure 1 for study sequence and group activity descriptions.

Figure 1. Study sequence and group activity descriptions.

Research design

Qualitative inquiry can contribute in many ways to the development and evaluation of health interventions that involve social or behavioural processes that are difficult to capture using quantitative methods alone (Hesse-Biber, 2012; Lewin et al., 2009; O'Cathain et al., 2013, 2014; O'Cathain, 2018; Russell et al., 2016; Sandelowski, 1996; Simon et al., 2015). Qualitative interviews asking previously inactive older adults who participated in the RCT about the motivators of and barriers to participating in their assigned group allowed us to explore how the interventions fit into the context of their lives and to understand the complexity of the environment in which the interventions were delivered and the people they were delivered to (O'Cathain, 2018).

For this study, we kept an interpretivist theoretical perspective (Crotty, 1998) that seeks to understand the world through individuals' lived experiences. Ethical approval was obtained through the University of Missouri's Institutional Review Board (IRB) (#2014256).

Participants

From the 46 RCT participants, five from each study group (SSSH, Walk, Con) were selected for interviews using a mix of purposive and diversity sampling based on RCT participants' sex and age. Sample size determination was based on similar qualitative research involving older adults' participation in group exercise programs (Dionigi, 2007; Watkins et al., 2019). Participants included nine women and six men, aged 60–86 years (mean age 72 years; see Table 1), and all were white. All participants were fully informed and provided written consent.

Data collection

We conducted individual, semi-structured interviews using an interview guide. The interview guide was developed with the multidisciplinary research team and piloted with another trained qualitative researcher (MWG). The guide included fixed questions to ensure consistency of what was asked to each participant. In addition, the interviewer asked follow-up and probing questions to clarify and expand upon participants' answers (Fontana & Frey, 1994). All interviews were conducted by the same researcher (LR) who had neither a professional nor personal link with the participants. Interviews were conducted either face-to-face or via phone depending on participant preference. During the interview, participants were asked to: 1) describe their main motivation for participating in physical activity and the personal benefits they get from being physically active; and 2) describe what they need to be physically active on a regular basis and what stands in their way of being more active. Interviews were audio recorded and transcribed using a professional transcription service (Rev.com). Transcribed files were reviewed against the audio to ensure accuracy.

Table 1. Participant characteristics.

	Total Participants	Mean Age (Range)	Sex
SSSH	5	69.8 years (60–84)	3 females, 2 males
Walking	5	76.2 years (60–86)	4 females, 1 male
Control	5	70.2 years (61–81)	2 females, 3 males

Data analysis

Two experienced qualitative researchers (LR and MWG) conducted a collaborative content analysis of all transcripts using coding software QDA Miner 5 (Version 5.0.34). An inductive category development approach was used to analyse the transcripts (Mayring, 2000). With this approach, each researcher separately identified unique content ideas within participants' statements and independently labelled ideas using categories and codes. Software was used to merge the researchers' coded files and identify coding discrepancies. All discrepancies were reviewed and discussed during meetings. In addition, after every five transcripts were coded, merged, and discussed, an Excel file of all

coded content was generated and reviewed to ensure the categories and codes were distinguishable from one another and coded segments fit within each respective category and code. These processes were aimed at refining code definitions and establishing trustworthiness of the data analysis and results (Merriam, 2009).

Lastly, categories were aligned with domains of the socioecological model, recognizing individuals as embedded within larger social systems and considering the characteristics of individuals and environments that underlie health outcomes (Glanz et al., 2015; McLeroy et al., 1988b). Our categories aligned with three socioecological domains: individual, interpersonal, and organizational. The individual domain represents participants' knowledge, attitudes, and perceptions about physical activity. The interpersonal domain represents participants' perceptions of the influence their family and friends have related to physical activity. Finally, the organizational domain represents the class-session feedback from participants.

To not prejudice participants' responses, data collection and anlaysis were conducted by Lisa Royse and Melisaa Warne-Griggs-two members of the research team who are not experts in physical activity research. The following are their reflexivity statements so that readers know the lens through which the analysis occurred:

Lisa Royse: "I work as an Assistant Research Professor at the University of Missouri School of Medicine where I use my knowledge and experience in qualitative research methods to gain a deep understanding of the experiences of health care providers and patients—understandings that I believe have the potential to improve patient care and health outcomes."

Melissa Warne-Griggs: "As a longtime educator, I believe in the power of education to make a difference in people's health. I currently work as an Associate Director of Knowledge Management at the University of Missouri School of Medicine where I conduct qualitative research to gain understanding of learner's experiences in professional online learning communities as well as patient and family experiences."

Results

Fourteen interviews were performed face-to-face in a private room on the University of Missouri campus; one interview was conducted over the phone. Average interview time was 45 minutes. Motivators of and barriers to engaging in physical activity were analysed across all study groups. Key motivators and barriers aligned with the individual domain of the socioecological model included perceived improvements in physical and mental health, existing health conditions, fear of getting hurt, and perceived lack of time and motivation. Findings aligned with the interpersonal domain included positive social influences, observed health deterioration in others, and the desire to spend time with and take care of family members. Motivators and barriers aligned with the organizational domain included monetary cost, accessibility, and inconvenient times and locations. For each quote, participant number (P#) and assigned study group (SSSH, Walk, or Con) are included. A summary of findings and representative quotes can be found in Table 2. See overall themes and subthemes in Figure 2.

Individual domain: physical motivators and barriers

Physical benefits

The desire to improve physical health was a main motivator to engage in physical activity. Most participants were motivated to participate in physical activity because they wanted to "be healthier and feel better" (P4, Con). They perceived that physical activity helps you keep healthy (P8, Con), live longer (P2, SSSH), avoid illness (P9, SSSH), and stay fit (P7, SSSH). "I just need to be healthier, you know, as simple as that" (P6, Con). "You just, you know what you should be doing and when you do it, it just feels good" (P14, Walk). One participant hoped that increasing their physical activity would reduce their medications: "Yeah, there are certain things that I have to take and I'm hoping to be able to get off some of these medications" (P5, Con).

Anticipated weight loss motivated more than half of the participants to engage in physical activities. Two participants specifically mentioned trying to take weight off their knees: "If I lost weight…it would also take some of the pressure off the knee" (P15, Walk). Two other participants were concerned with improving their fat-to-lean ratio. One person mentioned struggling with a quick weight gain resulting from a medication change: "I was doing really well, walking every day, feeling great and they put me on Lyrica. Lyrica works brilliantly for fibromyalgia, but I gained everything back that I lost … it just came back on so fast" (P5, Con).

For more than half of the participants, improving stamina and endurance was a motivator to participate in physical activity. Some wanted to get in better shape for travel excursions: "I just need to … be able to have more stamina so we can keep on travelling. It's not time for us to sit down yet" (P6, Con). "My wife's also gonna retire probably next year and we have plans to travel all over, so we want to be able to do that without having to worry about it" (P7, SSSH). Others described wanting more stamina to resume activities of daily living after dealing with a health setback: "I can't get up and down the steps. I have trouble driving because of my knee, standing for any

Table 2. Summary of themes aligned with domains from the socioecological model.

Theme	Subtheme	Representative Quotations
Individual Domain		
Physical Motivators and Barriers	Physical benefits	[physical activity] keeps me healthy and keeps me strong. You know, the older I get, the more I need to work at getting my strength up. (P8, Con)
		I'm concerned about my balance because I have fallen several times … it seems to be due more to the knee that I had replaced on the right leg … that foot just does not seem to raise high enough at times and I stub my toe and down I go and I hit my face every time I go down flat, I never can seem to grab something … .I've been concerned about that … so I saw this [opportunity to participate in study] and I thought, well, it doesn't hurt to see if I can get involved in it. (P9, SSSH)
	Existing health conditions	Well, it [preferred physical activity] really used to be walking, but, I've ruptured an anterior flexor tendon in my left foot so that I have foot slap in my right ankle. Then the last year has finally decided to give me pain from an injury that I got 64 years ago. And so walking's not as easy. (P3, SSSH)
		Uh, it's hard for me to breathe. I've got two mechanical heart valves and mechanical repair … I'm very concerned about my lungs to be truthful … lack of stamina and wind, trouble breathing or having to stop to catch my breath for an abnormally long time. (P5, Con)
	Fear of getting hurt/falling	The thing that concerns me most is that the only thing that stands between my husband and being in a nursing home permanently is my health. And so, I try to be very careful climbing stairs, for example, going up and down stairs. I try to be very careful about holding onto banisters, not tripping, not falling myself. So I don't have any concerns about exercise per se, but I want it to be safe exercise so that I don't hurt myself and therefore dim his chances of living at home. (P1, Walk)
		I think you always worry about getting hurt. Well not hurt as much but injured. You know, in the past as you age, I used to be an athlete and always fancied myself to be able to do all these great things. The older you get, the harder that is and it's so easy to get injured. Just thinking you can run from here to there, yeah, no you can't. That's the biggest concern. (P7, SSSH)
Psychological Motivators and Barriers	Mental benefits	Well, you just feel more alive. If you sit at home and just watch TV, which I am known to do you just sort of get dull every which way … it [physical activity] stirs your blood up and gets you breathing deeper. That type of awareness of your body and you feel more alert. (P9, SSSH)
		I know (physical activity) is a necessity because you know, when you start doing nothing you're going to decline pretty rapidly. And I see some of my age peer group that doesn't do anything and they get pretty docile. They seem to lose all physical strengths. And then along with that probably goes the lack of any type of motivation to continue doing what they've done over the years. (P12, Walk)
	Lack of time	Well, so I still work, I'm part time. But you know, when you're the boss, you're the director … So there's my job, there's my husband and his health. There are bills to pay. You know, there are obligations that take up a lot of my time. (P1, Walk)
		I'm so busy working, I don't really have recreational exercise … And with my schedule working four, 10-hour days plus part time, estate sale work, there's not a lot of time for structured exercise. (P4, Con)
	Lack of motivation	It's just not as easy as it was. I mean, I'm 80 years old and so it's more of an effort than it used to be. It has to be a conscious effort to do too much and get on the treadmill or walk up and down the steps a few extra times. I mean, we have big steps to the upstairs. It's easier to just sit around and not do much. (P14, Walk)
		My reluctance stands in my way more than anything. I'm just not a big exerciser … when I was playing golf, we played every Sunday morning. We had a grand, grand time. I used to run a little bit and even that was okay. As I've gotten older, I've gotten more sedentary. (P6, Con)
Interpersonal Domain		
Social Motivators and Barriers	Family and friend influence	All the kids are very active. They're very physically fit … .to be able to keep up with them when we're together, we've got to be a little more physically fit. (P7, SSSH)
		I don't think it influences, because it's not like I voluntarily am not active, so I don't think it does. Because if I could, I would, I'd keep up with them. I mean, we'd be doing stuff. I could sit here and name ten things that I would like to do. (P10, Con)
	Observing another person fall or deterioration from a fall	If you're a slug, you're going to end up not having any balance and my mother right now has no balance. And she has no muscle. I mean she's just, she's got a bad bone tumour and spinal stenosis and she can't do anything. And she's 91. And she can drive a car but she can't walk very far. So, I mean, she's fallen a lot and you know, because of her, I don't want to be there. I don't want to do that. I want to keep as active as I can so I'm not an invalid. (P2, SSSH)
	Desire to spend time with and take care of family members	Well, my sons and my daughter in law and my grandkids, I want to be physically active for them, to pick them up. (P2, SSSH)
	Group exercise	There's a group of people, they're all kind of waiting on you and they all helped you be accountable. I liked that part … You know they kind of kept you going, we kind of cheered each other on. (P11, SSSH)
		Some of the ladies that I talked to as we go up and down the steps let me know that the Senior Center, I've never been to the Senior Center … there's a yoga class or some kind of class that helps with balance. (P3, SSSH)
		I was the slowest walker in the group. I wasn't the oldest I found out later, but I walked slowly because I have arthritis. And take a lot of Tylenol for my arthritis and stuff. And I increased, I don't know, three or four laps the first time. All the way up to seven … I think people were embarrassed for me. And they didn't say anything when they passed me or anything so that was kind of awkward, but I thought I'm doing the best I can. And this is your problem, not mine. (P14, Walk)
	Class instructors	The instructor was always so good about saying, this is no competition … if somebody she could see was struggling, then there was an alternate thing that they could do. (P3, SSSH)
		She was very good about telling us to touch the wall if you need to, if you don't have to then don't, but she was very good about making sure everybody was stable because 60- to 85-year-olds. (P15, Walk)

(*Continued*)

Table 2. (Continued).

Theme	Subtheme	Representative Quotations
Organizational Domain		
Environmental Motivators and Barriers	Financial	It was free. It had a paycheck at the end. It was at my former employer's location, so there were a lot of knowns and some expected benefits for no cost except a little time. (P4, Con)
		The last thing I did was … some guy around town who has been an exercise specialist forever … but it was very expensive, so we dropped out of that. (P14, Walk)
	Transportation and accessibility	I would like to do the evening one, which starts at 5:30 or 6:30 but it's dark at that time and I'm very careful with my driving. I don't drive at night and the one in town on Monday and Wednesday mornings, I'm still doing a lot of driving … I tell you, thank goodness I grew up in this town and I know a lot of old ways old road streets that have less traffic, I really do try to avoid as much traffic as I can. So I'm really thinking, hmm, I just don't know if I will try to continue. (P9, SSSH)
	Time and location	I know one of them's [SSSH class] during the day, but I'm working. And if I get off work at 4:00 and go home and then come back here by 5:30, that's just such a waste of time. (P2, SSSH)
		The timing was not good for me. The evening I couldn't get there before 6:00 if I was going to oversee my husband's dinner. And so I had to switch to days, well, Tuesdays were not good days for me. Thursdays weren't good days for me because it interfered with my work. So it wasn't the exercise per se, it was the timing of it made it difficult. (P1, Walk)

length of time, like to cook or anything like that is a problem. I was a very active person at home before all of this, so those are some of the things I would like to be able to do" (P10, Con).

One-third of the participants were motivated to participate in physical activity to either build or maintain strength. Two mentioned their strength declining with age: "I thought that it might possibly help me develop some strengths and physical abilities that I have been losing" (P10, Con). One participant hoped to put off knee surgery by building strength: "I may have to have surgery, but I, I'm hoping to put that off. I would like to put it off until I'm 65 if at all possible. So, I want to get my strength training and walking in place just to kind of put off surgery" (P15, Walk).

A few participants were motivated to participate in physical activity to improve their balance: "I'm concerned about my balance because I have fallen several times" (P9, SSSH).

Existing health conditions

Poor existing health conditions was identified as a barrier to participating in physical activity. Health conditions included a heart condition, knee injury, asthma, cancer, herniated disc, irritable bowel syndrome, diverticulitis, sleep disorders, arthritis, ruptured tendon, vertigo, fibromyalgia, obesity, depression, binge eating, and multiple sclerosis (MS). Most commonly, participants discussed either associated pain or fatigue that made physical activity more challenging: "You know, I've got arthritis, so I hurt constantly … my knees do hurt more when I'm more active" (P8, Con). "It's part of the MS business and I've had that for like 14 years. So, you know, just periodically those symptoms show up, but the fatigue is one that just out of the blue just wipe you out" (P7, SSSH). One person discussed having to use a walker resulting from a knee injury making physical activity difficult. Two people described the effects of medication to treat a health condition as being a barrier to activity: "I don't have a lot of stamina because along with this, to keep my heart from not being in AFib, they've had me on Pacerone and that makes my heart rate in the forties, so I tend to tire or feel tired. So, he cut my Pacerone back to every other day … it hasn't come up a whole lot" (P10, Con).

Fear of getting hurt

Another identified barrier to engage in physical activity were participants' concerns about getting injured. Of those with concerns, most related to worries about their balance or falling: "I worry sometimes about my balance because of my knees and then just my overall strength. We do like to hike, but just the stamina to go up and down the hills and when it's uneven ground, just not wanting to fall" (P11, SSSH).

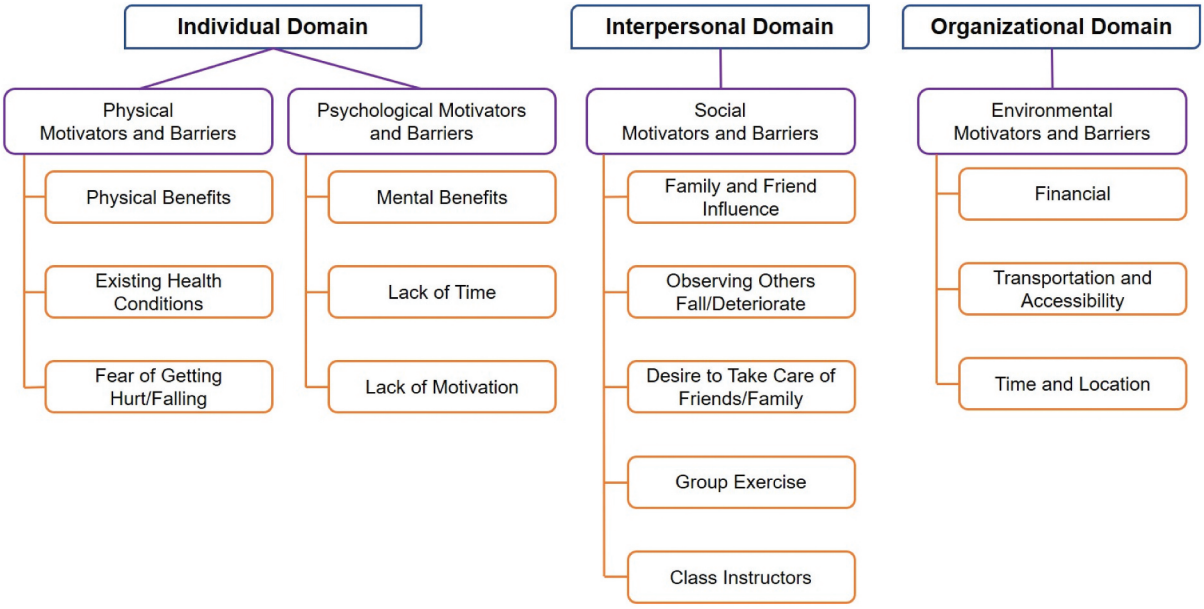

Figure 2. Overall themes and subthemes.

Individual domain: psychological motivators and barriers

Mental benefits

Regardless of study group, participants believed that, overall, physical activity positively impacts their emotional wellbeing and mental health: "It [physical activity] just makes everything much more positive. It's much easier to move through life" (P7, SSSH). Most participants expressed how physical activity helps them have a positive outlook on life and feel better emotionally: "When you're doing things, it lifts you up and you don't have time to think of bad things" (P8, Con). Two participants explained that while they might not feel better doing it, they feel accomplished after because they have done something good for themselves: "Well, you just feel better about yourself . . . you know what you should be doing and when you do it, it just feels good" (P9, SSSH).

Lack of time

Ten participants described time as being a barrier to participate in physical activity. They expressed having multiple obligations that get in the way of devoting time for exercise: "Well, I am busy. I have a schedule. Every day I have things that I'm doing" (P9, SSSH). Obligations included working, taking care of a loved one, volunteering, and clubs or groups. Some described a tendency to prioritize other things over physical activity: "Just all my activities and obligations with two book clubs and assistance league and a church group … and bridge club" (P14, Walk).

Lack of motivation

Eight participants expressed concerns related to lack of motivation and their ability to maintain physical activity. They described not having enough energy or motivation to participate in physical activities beyond their daily living activities: "By the time I do what I need to do, it seems like I don't really have the desire to do anything else much. Mostly it's this not having the energy to get up and go and feel good. That bugs me. And when I say feel good, I mean energetic and alive" (P13, Walk). They described a reluctance to participate in physical activities and indicated that laziness was a main concern for them: [What stands in your way from being more active?] "Being lazy, finding it easier not to do any exercise or any type of activity than it is to actually get up and do it" (P12, Walk). Some stated it was easier to do nothing while others described a tendency to prioritize other things over physical activity.

Interpersonal domain: social motivators and barriers

Family and friend influence

About half of the participants felt that family and friends' activity levels positively influenced their own: "Well, [wife's name] is a big encourager because she wants me to do it. It's not a matter of influencing, it's a matter of ordering. Get out there and do it, get moving. Get off your tuckus" (P6, Con). The other half felt that others' activity level did not influence their own: "I don't live with any of the kids. Then the two boys that live here in (town), they don't come around except to eat once in a while, stuff like that" (P13, Walk).

Observing deterioration in others

Observing another person fall or the consequences of a fall was identified as a motivator for physical activity.

Four people described how the experience of seeing a family member or friend fall or seeing the consequences of their fall had prompted them to be more cautious and/or curious about how to improve their balance and bone density: "I see my sister through this shoulder dislocation. She's struggling to get back to just being her old self and she can't lift her grandchild and it just breaks my heart. I go help her. And I do that part, so I want to be able to continue to do those things" (P15, Walk).

Desire to spend time with and take care of family

Several participants were motivated to exercise so they could play and visit with their grandchildren or spend quality time with their family: "I have a new granddaughter, I want to be able to have her all weekend … so I want to do enough of that strength training to, you know, be able to lift the grandchildren" (P15, Walk). One person wanted to exercise to maintain her own health so she could take care of her husband who was facing health conditions: "My husband can't carry anything, you know, he uses a cane or a walker or wheelchair and so I have to be the one who does it. So, I have to be strong enough to lift things" (P1, Walk).

Group exercise

Many participants described the benefits of exercising in a group as motivation to be accountable and as an opportunity to socialize. For some, having others count on them was motivation to show up and to put forth full effort and pay more attention to technique: "If I'm not held accountable, I'm not going to do it … .someone held me accountable, being here at this time, I'm showing up and they would show up just the same way I do" (P2, SSSH). Others saw an exercise group as an opportunity to socialize. These participants enjoyed meeting new people or spending time with friends through physical activities: "I think building relationships really does (make a difference) … .I think every time you have a touch outside that it keeps you out of losing contact with other people and I think that's huge" (P15, Walk). A couple of participants mentioned that groups had encouraged each other, and others mentioned exercise as an opportunity to bond with others over a shared activity. One individual mentioned that group members had shared additional health related resources with them during their exercise group.

While most participants described positive aspects of exercising in a group, some also explained negative aspects. The most frequently mentioned was making comparisons. Most often this was of the participant comparing themselves to others in the group, but some felt that others could be competitive: "Well, I was the oldest person there. [That felt] a little threatening. But it was so cute watching these others take on more weight and more weights and they were really working at this and I just kept saying, if I can maintain this weight, I'm doing pretty well…And I am a competitor. I realize I compete, and I always did that … I was aware of my weaknesses and trying to take care of not overdoing it. So that was more of a challenge for me for this group and yet I couldn't compete with the others adding weights and more weights" (P9, SSSH). Participants mentioned feeling uncomfortable joining activities in which others already knew the steps or moves of the exercise. Five people mentioned that pacing was another issue with group exercise and a benefit of exercising alone. Sometimes people prefer to go at their own pace and not have to wait or try to keep up with a group: "Well, I would prefer not being in a group doing the same thing that the entire group is doing. Because then there are always at least 50% doing better than me and some that are doing less that I would like to go help in some way" (P3, SSSH). Several people mentioned having to talk to others as a con of group exercise and a pro of exercising alone. For one person, hearing made conversations while exercising very frustrating: "My hearing is not real good. I have one hearing aid, but the other ear does not, I can't even use a hearing aid in it. It's just mush now. So, I don't hear everything … but that's another reason I hate being with people and have to say, I'm sorry, what did you say?" (P13, Walk).

Class instructors

All five participants in the SSSH group and two in the Walk group complimented the class instructors and described them as knowledgeable, not pressuring, and helpful. Some liked one instructor's style over the other. Others described how the instructors encouraged individuals to use different weights and modified exercises for their abilities: "[instructor's name] was very well versed. She's the one that's been doing this for years and she gave an explanation that you don't want to do this with weights very long and hold it because it's going to hurt the knees or it's going to hurt the back. She had extensive knowledge and she modified things so many times in so many ways that we would, instead of holding it for a count of ten … we would stand on one foot instead of on the toe … she modified it and she was so knowledgeable. I would like to have someone that was to that level" (P2, SSSH).

Organizational domain: environmental motivators and barriers

Financial

A few people were motivated to participate in the RCT study by the monetary incentive and free registration

into the SSSH class: "the money helped too, you know, as in the motivation, cause I'm a retiree" (P5, Con). Similarly, participants discussed cost as a barrier to participate in organized exercise classes: "but it [exercise class] was very expensive, so we dropped out of that" (P14, Walk).

Transportation and accessibility

Participants discussed transportation as a barrier to participate in group physical activity. One participant also described worry about wheelchair accessibility to classes: "I have to worry about transportation. Are the girls going to have to take off work to take me? When I get to where I'm going, can I get where I'm going … I chose the other place because I didn't want to ride that chairlift again" (P10, Con).

Time and location

Another barrier was time and location. Some participants indicated the timing of the classes was inconvenient. Two SSSH participants and one Walk group participant did not like the location of the classes and described it as a hassle to drive there: "I can't do it during the day so it's really sometimes a hassle to drive all the way across town to get here for that. I was hoping at one point when we first started talking that they said there were several places around town that did this" (P2, SSSH). One indicated the location of the walking classes was boring and hot and thought the mall might be a more interesting place because you could look in shop windows. Another in the walking group did not like walking on concrete.

Discussion

Barriers to engaging in physical activity in older adults often outweigh the motivators, as evidenced by the high rate of inactivity in this portion of the population (CDC, 2019; Watson et al., 2016). It has been well established that a physically active lifestyle can aid in the prevention or delay of chronic disease as well as promote health and well-being in people of any age (CDC, 2019; Schutzer & Graves, 2004; U.S. Department of Health and Human Services, 1996). Even with this knowledge and a desire to be active, most adults over the age of 60 are not meeting the recommended benchmarks for physical activity (Keadle et al., 2016). Fitting with the socioecological model, findings of the current study showed that individual, interpersonal, and organizational level motivators and barriers influenced physical activity behaviour. Barriers to regular physical activity perceived by participants of the current study include existing health conditions, fear of getting hurt, negative social influences, perceived lack of time and motivation, inconvenient times and locations, and monetary cost. Further, they identified improvements in physical and mental health, positive social influences, observing health deterioration in others, and the desire to spend time with and take care of family members as their motivation to engage in exercise.

Individual motivators and barriers

The positive evaluation of the physical and psychological benefits of physical activity by the adults in our study was a motivator to participate in physical activity. The participants were particularly motivated to improve their physical health in areas that impact primary activities of daily living, citing motivation to improve stamina and endurance, build strength, and improve balance. These findings align well with previous studies, further confirming these as primary areas to emphasize in programs targeting this age group (Baert et al., 2011; Bethancourt et al., 2014; Burton et al., 1999; Costello et al., 2011; Maula et al., 2019). In so doing, exercise programs for older adults can motivate participants by emphasizing benefits to their daily routines. Mental health is an equally important benefit of physical activity in all age groups, but particularly in older adults (Dionigi, 2007; Netz et al., 2005; Singh et al., 2005). Perceived or anticipated improvements in psychological well-being through improved mood were associated with older adults' motivation to participate in physical activity, a finding consistent with the literature (Baert et al., 2011; Bethancourt et al., 2014; Maula et al., 2019). Similar to dichotomies found in physical health, the mental health motivators are juxtaposed with significant barriers such as perceived lack of time (Baert et al., 2011; Costello et al., 2011; Maula et al., 2019) and lack of motivation (Baert et al., 2011; Bethancourt et al., 2014; Costello et al., 2011), a finding supported by our study. These barriers may require additional considerations and tactics to help the target audience to overcome. Social support may play a key role in overcoming these psychological barriers, as evidenced by social modelling and social persuasion (important aspects of social support) having positive impacts on exercise adherence (L-L. Lee et al., 2008; Mcauley et al., 1994).

While positive attitudes about exercise are important, for older adults, perceived behavioural control—one's perception of the degree to which various factors make it easy or difficult to carry out the behaviour (Glanz et al., 2015)—may be a better predictor of physical activity participation (Dean et al., 2007; Durand & Nigg, 2016; Kosma, 2014; Rhodes et al., 2008). Regardless of how much older individuals desire to undertake a health behaviour, they must believe they are capable of the behaviour before they will initiate it (Durand & Nigg, 2016). Personal agency, or "bringing one's influence to bear on one's own functioning and environmental events" is a major

factor influencing behaviour intention and includes the construct of self-efficacy from social cognitive theory (Glanz et al., 2015). Self-efficacy is one's degree of confidence in performing the behaviour in the face of various obstacles and challenges (Bandura, 1997). In older adults' relationship with exercise, self-efficacy often takes hold once they demonstrate to themselves that they can indeed perform the exercise, and a positive feedback loop is formed (McAuley et al., 2011). Self-efficacy is a critical factor in predicting exercise behaviours in inactive older adults whose physiological state may be declining (McAuley & Katula, 1999). Self-efficacy itself can decline with ageing and often involves reappraisals and misappraisals of an individual's capabilities (Bandura, 1997); in other words, re-evaluation of one's capacity to exercise. While improved physical health motivates individuals to engage in physical activity, older adults also perceive their current poor physical health and existing health conditions as barriers to participating in physical activity and this negatively influences their self-efficacy (Baert et al., 2011; Bethancourt et al., 2014; Maula et al., 2019; Moschny et al., 2011). Our findings demonstrate this contrast at the individual level. For example, one participant was motivated to engage in group physical activity to reduce their medications; however, the same person described the medication they were taking as a barrier to physical activity resulting from the weight gain it caused. Similarly, another participant was motivated to participate in physical activity to improve their stamina and identified their medication as a barrier to physical activity because it lowered their energy levels. Overcoming these perspectives is a primary challenge for those developing targeted exercise programs for older adults, as barriers such as medication usage can rarely be eliminated without considerable consequences.

In addition to perceived control, knowledge and skills to safely perform the behaviour is important to consider to close the intention-action gap. Fear of injury during exercise is often overlooked but a very important barrier to physical activity in older adults (Hamer et al., 2021). For our participants, structured group activity with a class instructor mitigated barriers such as participants' fear of getting hurt and fostered knowledge and skills that enabled participants to safely engage in physical activity. Instilling an understanding of the support systems present in group exercise can dispel these fears and encourage older adults to engage in structured exercise.

Interpersonal motivators and barriers

Sources of self-efficacy include social support behaviours (Bandura, 1997; Resnick et al., 2002). It is well known that there is a positive association between social support and physical activity (Bethancourt et al., 2014; Franco et al., 2015; Maula et al., 2019; Spiteri et al., 2019). Positive encouragement and influence from family and friends, other exercisers acting as role models, and class instructors providing information enhances self-efficacy (Dionigi, 2007; Resnick et al., 2002). Our study found that perceived social support is particularly important for promoting physical activity in older adults. While some participants were influenced positively by family and friend encouragement to participate in exercise, other social influences such as observing another person's deteriorating condition and the desire to spend time with and take care of family members were also motivators. With advancing age, one's social circles tend to get smaller and external motivators to stay active can diminish as well. Group exercise, such as the SSSH program and Walk group studied here, can combat feelings of isolation by providing peer motivators and instructional support. Social influences perceived as barriers for some older adults to participate in group exercise included individuals' competitive nature and a tendency to compare themselves to others. Perceived competitiveness is hard to overcome, particularly if a person associates exercise with competitive sport. But placing an emphasis on comradery and friendship in these group settings can assuage anxiety. In our study and in that of others, group participants provided verbal persuasion by "cheering each other on" and shared information about exercise and health with one another (Dionigi, 2007). This type of social support and accountability to others can concomitantly increase self-efficacy and sense of control over one's situation (Lachman et al., 2018).

Organizational motivators and barriers

Environmental barriers for older adults to participate in and maintain group physical activity include transportation, accessibility, cost, and convenient time and location (Baert et al., 2011; Bethancourt et al., 2014; Maula et al., 2019). Our participants described competing priorities such as work and other obligations interfering with physical activity. Proximity or access to transportation to and from facilities are important for utilization of exercise programs for any age group, but are of particular importance in older adults who may have a limited capacity to walk or drive (Lin & Cui, 2021). Research on the Medicare-sponsored Silver Sneakers program identifies having access to free or inexpensive classes or exercise facilities as a significant motivator (Bethancourt et al., 2014). We found that financial cost was a facilitator to physical activity because participants received free registration to the SSSH program, which typically has a cost of around $50 per 8-week session. Nevertheless, financial cost

was identified as a barrier to physical activity maintenance outside of the provided program and continued participation in group exercise programs.

How SSSH promotes motivators and overcomes barriers

Barriers and motivators to physical activity for older adults exist and vary widely, even under ideal circumstances. Community-based older adult group exercise programs alleviate many of the perceived barriers to exercise while simultaneously bolstering some motivating factors. Ways in which the SSSH program promotes motivators and mitigates barriers include implementing an evidence-based community program, being flexible, training instructors, and facilitating social interaction.

Community-based group exercise programs should be evidence based and follow physical activity recommendations for older adults (U.S. Department of Health and Human Services, 2018). Ideally, a body of peer reviewed evidence of efficacy should be published before scaling the program. For example, SSSH was piloted on a small group of older adults in 2005. Since 2005, multiple articles have been published including a randomized control trial (Baker et al., 2020) indicating SSSH's effectiveness as a community-based group exercise program for older adults.

Practitioners should be nimble and prepared to modify existing programs to overcome the most common barriers to exercise, such as lack of time, location, and transportation. For example, in 2020 SSSH created a virtual programming option so participants could still enjoy the health benefits of group exercise but from the comfort of their home during community-wide COVID stay-at-home orders. In addition, initial training as well as continuing education for the leaders of group exercise programs is essential for a well-functioning program. Older adults' physical abilities vary, and one size programming often fails. Group exercise instructors need adequate training and experience to modify exercises and correct form, while simultaneously providing positive reinforcement in a non-competitive manner. In the SSSH program, instructors complete an online training, in-person certification, and are required to attend annual program updates.

Group exercise lends itself towards social interaction, and for many older adults, socializing with other participants can be more impactful than the physical benefits of the exercise. Instructors should encourage and facilitate social connections by opening the facility before and after class, using name tags, calling participants by name, and encouraging group interactions. For example, an instructor might say something like, "Good morning class. Did anyone do anything exciting over the weekend?"

This study has some limitations. This study was of older adults in one community in the Midwestern USA and all participants were Caucasian, so perspectives reflect only similar populations and racial backgrounds. Thus, transferability of the findings is limited due to small sample size and the relative importance of the motivators and barriers identified in our sample may vary from those of more racially and ethnically diverse groups. Interviews were conducted within one to two weeks of participants completing their eight-week intervention, so motivators and barriers were fresh-of-mind and easy to recall. However, findings do not reflect long-term perceptions or follow-through with physical activity maintenance. Although nearly all participants noted their intentions to exercise in the future, there is often an intention-behaviour gap in which participants have positive intentions but fail to act on those intentions (Orbell & Sheeran, 1998; Rebar et al., 2019; Rhodes & de Bruijn, 2013). Future studies need to include more longitudinal assessment of physical activity maintenance after initial participation.

Our results identify a range of factors that motivate and stand in the way of older adults' engagement in group physical activity. These factors influence older adults' self-efficacy and should be incorporated into the design of new programs for older adults and existing programs to encourage initiating and maintaining physical activity.

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The authors report there are no competing interests to declare.

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Data availability statement

The data that support the findings of this study are available from the corresponding author (LR) upon reasonable request.

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